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BEFORE THE ARIZONA CORPORATION COMMISSION

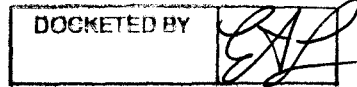
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Arizona Corporation Commission

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ORIGINAL

IN THE MATTER OF RESOURCE PLANNING
AND PROCUREMENT.

DOCKET NO. E-00000V-13-0070

COMMENTS OF WESTERN RESOURCE ADVOCATES

Western Resource Advocates (WRA) hereby files:

- a) Comments on Arizona Public Service Company's (APS's) resource plan, as revised on September 17, 2014.
- b) The slides presented by WRA at the September 11, 2014 resource planning workshop. These slides have been updated to reflect APS's supplement to its resource plan in which it chooses the Managed Coal Strategy (Coal Reduction Portfolio) and to incorporate additional edits. The slides are attached to these comments.

A. Comments on APS's Managed Coal Strategy. On September 17, 2014, APS filed an amendment to its 2014 resource plan to indicate that its preferred choice would be changed to the Coal Reduction Portfolio, which APS renamed the Managed Coal Strategy. In the Managed Coal Strategy, APS would retire Cholla Unit 2 in 2016 and retire Cholla Units 1 and 3 in the mid 2020s or convert those two units to natural gas. In addition, APS requests that its proposal to retire Cholla Unit 2 be approved pursuant to A.A.C. R14-2-704(E).

WRA supports APS's proposed discontinuation of coal-fired generation at Cholla inherent in the Managed Coal Strategy. We concur with Staff's recommendation (p. 103 of its assessment of the 2014 resource plans) that the Commission approve the retirement of Cholla Unit 2 as requested by APS per A.A.C. R14-2-704(E), recognizing that Staff indicates that approval would not imply a specific treatment or recommendation for rate base or rate making purposes in APS's future rate filings.

We note that:

- 1. The Managed Coal Strategy does not increase costs according to APS's analysis. Slide 6 of WRA's updated presentation (contained in the attachment) indicates that the cost of each of the portfolios examined by APS is about the same under each of the scenarios

that APS investigated. Differences in costs across portfolios and within a given scenario are well within any reasonable margin of error over such a long time horizon.

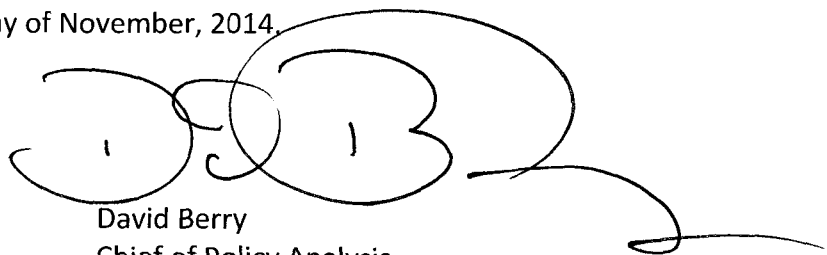
2. The Managed Coal Strategy will reduce APS's carbon dioxide emissions as compared to the base portfolio which is very similar to the old selected portfolio (slide 17). Nonetheless, carbon dioxide emissions are still increasing.
3. APS's reliance on natural gas increases so that 35% of all energy resources in 2029 require combustion of natural gas (slide 5).
4. Natural gas prices have fluctuated wildly in the past (slide 11) and it is prudent to expect prices to be subject to large variations in the future.

Therefore, WRA recommends that:

- a. To manage gas price risk and to further reduce carbon dioxide emissions, in future resource plans APS should examine portfolios that reduce its reliance on natural gas by substituting renewable energy and additional energy efficiency resources for natural gas resources. As part of this future portfolio, APS should also consider a more specific set of investments in energy storage, smart inverters, and other technologies to better integrate solar and wind energy into its portfolios. APS should also consider locating some new renewable resources near the Cholla site.
- b. In future resource plans, APS should evaluate additional coal plant retirements.

B. Comments on Load Forecasts. APS's load forecasts appear to be high in light of slower population growth, an increase in low income customers, declining residential sales per customer despite hotter weather, more efficient energy use, and distributed generation (slides 7 - 10). We concur with Staff (p. 103 of its assessment of the 2014 resource plans) on this point and agree with Staff that APS should reexamine its load forecasting techniques prior to filing its 2016 IRP. A long-term slow-down in load growth will also lessen the need for central station generation resources.

Respectfully submitted this 24th day of November, 2014.



David Berry
Chief of Policy Analysis
Western Resource Advocates
PO Box 1064
Scottsdale, AZ 85252-1064
david.berry@westernresources.org

Attachment: WRA updated slides entitled "What Should Commissioners Consider When Reviewing Arizona Resource Plans."

Original and 13 copies filed with Docket Control; electronic copies to parties of record.

What Should Commissioners Consider when Reviewing Arizona Resource Plans?

Presentation to the
Arizona Corporation Commission
September 11, 2014

Docket No. E-00000V-13-0070

(updated to reflect changes in APS's plans and to include additional edits)

David Berry



WESTERN RESOURCE
ADVOCATES

david.berry@westernresources.org

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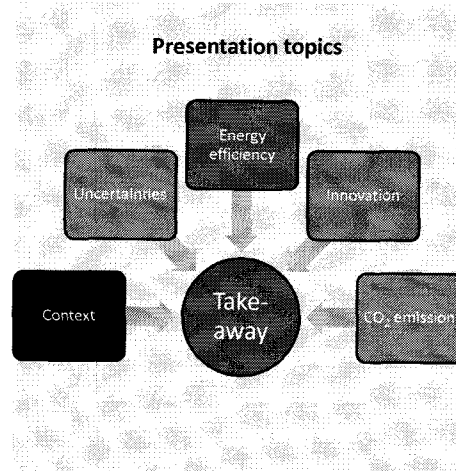
Purposes of resource planning

- To take a long term perspective
- To be imaginative (as opposed to simply grinding out lots of calculations)
- To analyze alternative (future) resource portfolios for a given utility
- To obtain input from a wide-range of stakeholders
- To acknowledge a plan that will provide the greatest public benefit over the long run

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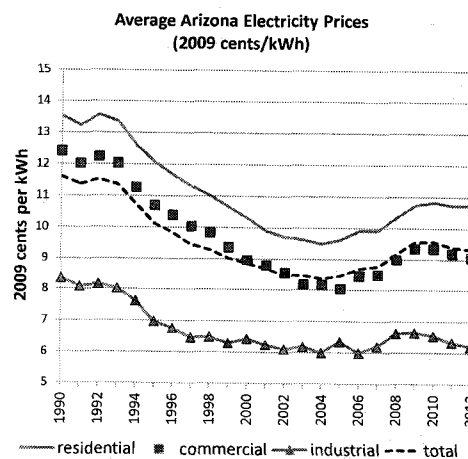
Often we get lost in details. What are the big themes the Commission should look for?

1. Is uncertainty recognized and managed?
 - a) Factors affecting the demand for electricity may be changing
 - b) Future natural gas prices are impossible to predict accurately
2. Are innovation, entrepreneurship, technological change, and social change adequately incorporated into the plan?
3. Is energy efficiency part of the plan?
4. Are CO₂ emissions addressed?
 - a) What is the trajectory of CO₂ emissions – increasing, decreasing?
 - b) How can CO₂ emissions be reduced?



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Context: AZ electricity prices are generally lower than 20 years ago: electricity prices reflect additions of new facilities & fuel prices



Factors affecting prices

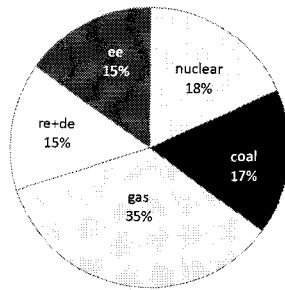
- Depreciation of large capital additions
 - Coal & nuclear plants completed in the 1980s and 1990:
 - Springerville 2, 1990
 - Palo Verde (1986-1988)
 - Springerville 1, 1985
 - 1980: Cholla 3, Craig 1, Coronado 2
 - Springerville 4, 2009
- Very high natural gas prices, 2005-2008 (lagged effect via fuel adjusters)
- RES, DSM program costs (less than \$0.01 per kWh)

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Context: APS's vision of 2029 according to its resource plan (coal reduction portfolio)

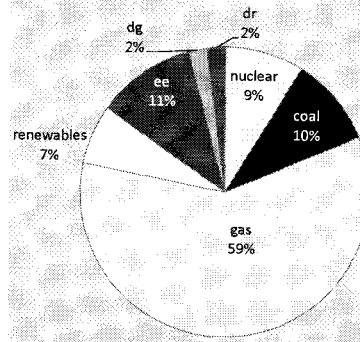
Energy mix: about half the MWh come from fossil fuel combustion

APS Energy (MWh) Mix, 2029, Coal Reduction Portfolio, Current Path Scenario



Capacity mix highly reliant on gas
Note: gas capacity factor = 26%

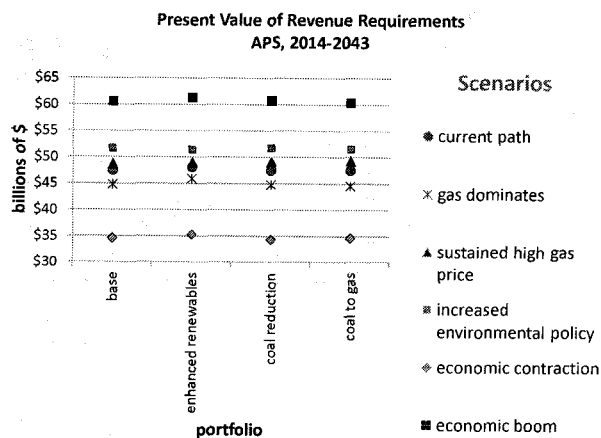
APS MW Contribution at Peak in 2029, Coal Reduction Portfolio, Current Path Scenario



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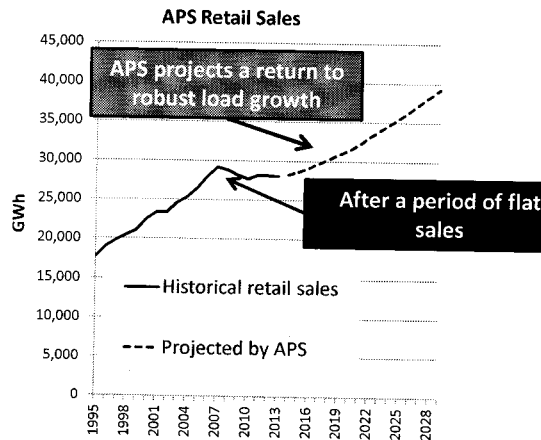
Context: APS's projected costs of its alternative portfolios are similar within each of its various scenarios

- Scenarios reflect factors APS cannot control; portfolios are under APS's control
- According to APS's analysis, cost is **NOT** a deciding factor among portfolios
- Cost differences are driven by factors APS cannot control



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Uncertainties: load growth Is there a discontinuity with past trends?

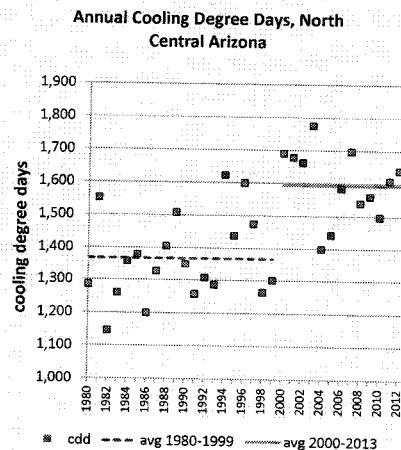
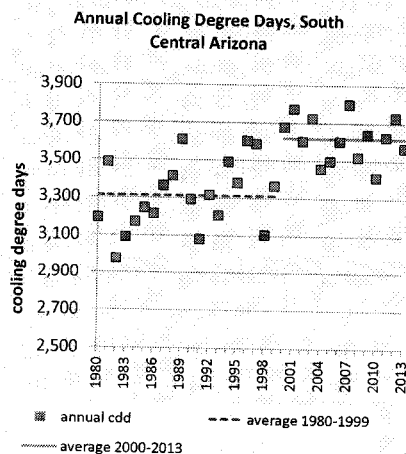


Factors affecting load growth:

- Demographic changes
- Economic changes
- Energy efficiency
- Distributed renewable energy
- Weather

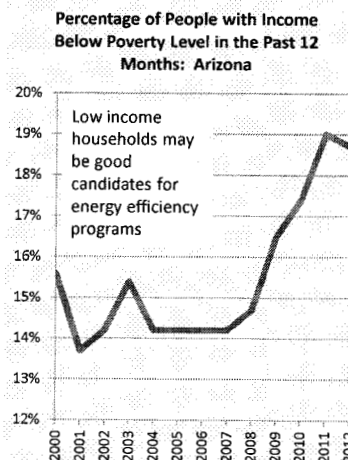
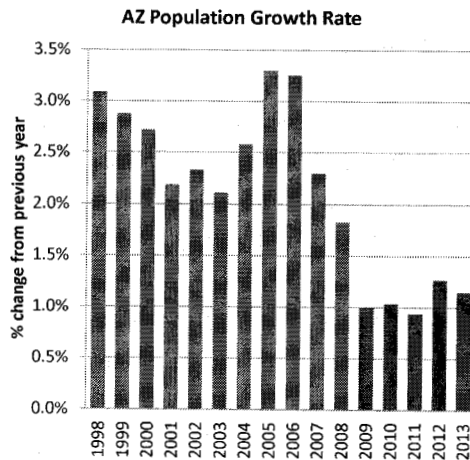
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Summers are getting hotter in AZ which should tend to increase electricity consumption



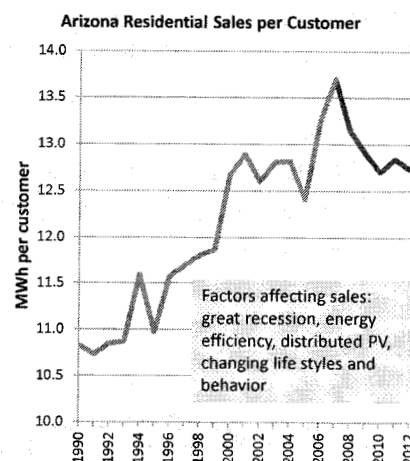
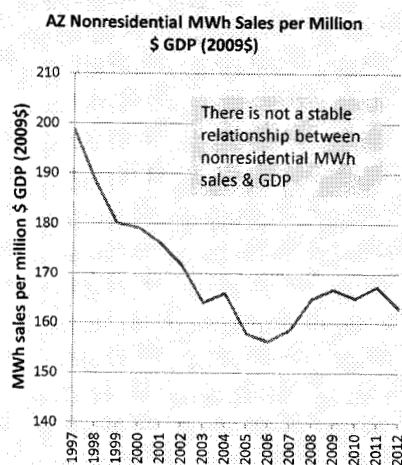
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Population growth has slowed and the prevalence of low income customers has increased; both trends may reduce the growth rate of electricity sales (data source: Census Bureau)



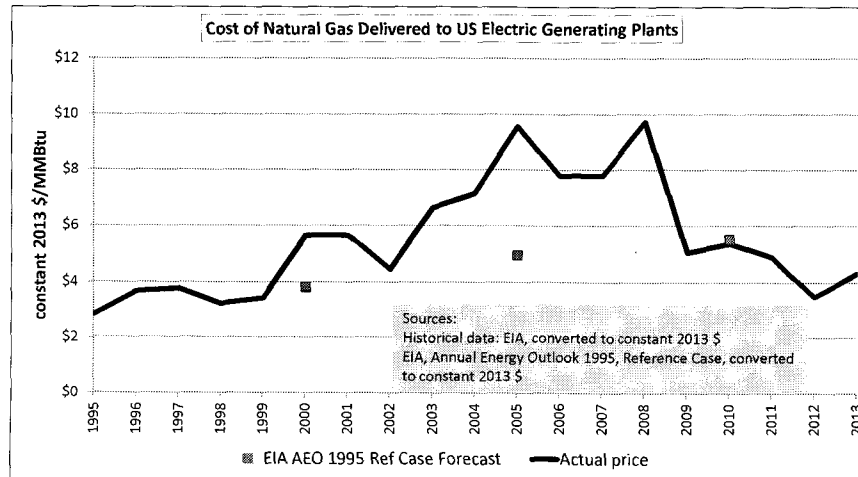
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The past is not a reliable guide to the future with regard to electricity sales



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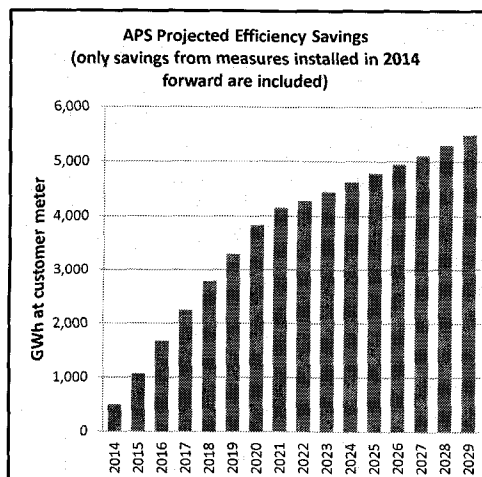
Natural gas prices fluctuate wildly. It's hard to accurately project natural gas prices over the long term



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The role of energy efficiency

- APS's planned efficiency will comprise 15% of its energy resources in 2029
- Without those EE resources:
 - APS will need to pay for more generation capacity & more fuel
 - APS will have fewer options to reduce CO₂ emissions
 - Customers' bills will increase as efficiency is the lowest cost resource



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Innovation can occur rapidly and can profoundly change an industry

- A few examples of recent innovations
 - PV on noise barriers, at airports, in the water supply system
 - PowerParasols®
 - **Leasing model for rooftop solar**
 - Market transformation for energy efficiency
 - Energy storage
 - Micro-grids
 - Solar roadways (?)
- **Taken together these & other innovations may result in significant disruptions to business as usual**

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Energy efficiency market transformation: new pathways to energy efficiency

Through creation of social capital

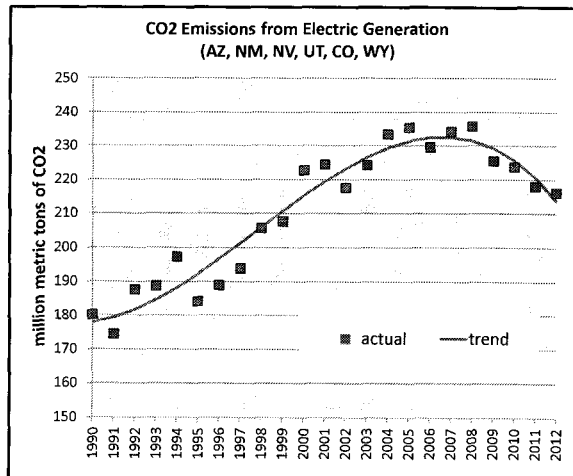
- Social capital consists of shared norms, expectations, and understanding
- Mobilizing resources: community organizations educate consumers, train contractors, distribute efficiency measures, offer personalized assistance to consumers, etc.
- Creating social capital: these organizations advance energy efficiency by **fostering trust, empowering communities to take ownership of efficiency programs, using social networks to increase participation, & using partnerships to expand their own capabilities**

Through market opportunities and entrepreneurship

- Opportunities to apply best practices
 - Many large companies such as Kroger have clean energy goals & programs
- Opportunities for information and communications
 - Identifying wasted energy in building operations by using smart meter data combined with weather & other data
 - Using smart phone apps to control thermostats or appliances remotely
 - Smart homes
- More efficient design
 - Meritage Homes

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What is the trajectory of carbon dioxide emissions?



Factors affecting emissions decline:

- Coal plant retirements
- Improved energy efficiency
- Renewable energy
- The great recession

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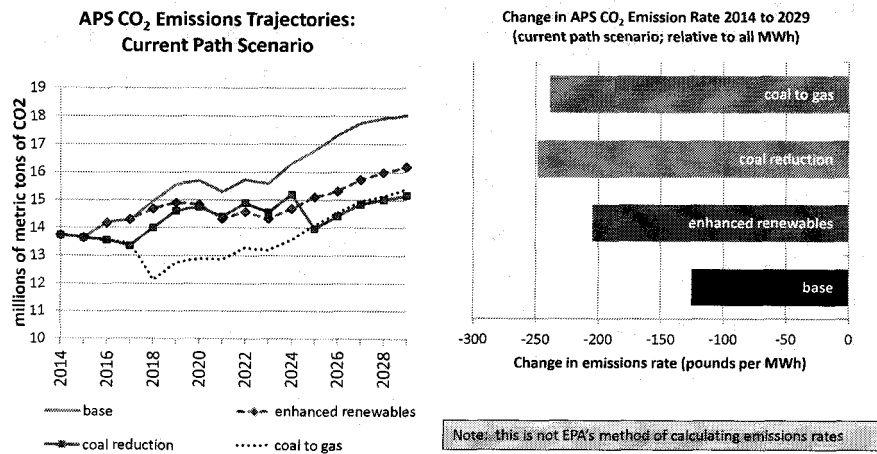
How can Arizona reduce its CO₂ emissions rate (lbs per MWh) from fossil fuel plants to meet the proposed EPA carbon rule?

1. EPA's proposed rule would require significant decreases in the emission rates of fossil fuel power plants in AZ*
 - EPA's 2030 goal for AZ is 702 pounds per net MWh. This goal pertains to the state, not to individual utilities.
2. Practical steps AZ utilities could take to reduce CO₂ emissions
 - Continue energy efficiency programs consistent with the energy efficiency standard
 - Increase the use of renewable resources (geothermal, solar, & wind)
 - Substitute gas-fired generation for coal-fired generation

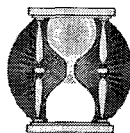
* AZ coal units are Apache Station, Cholla, Coronado, and Springerville (other coal plants serving AZ customers are in Indian country or in other states)

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Under APS's IRP, total CO₂ emissions will increase but APS's emissions intensity declines



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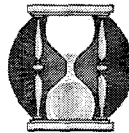


2 minute take-away for the Commission

✓ *In reviewing the 2014 resource plans, the Commission should consider:*

- *The uncertainty of load growth*
- *Fossil fuel price risk, especially natural gas prices*
- *CO₂ emissions & impacts*
- *The role of renewable energy and energy efficiency*
 - Renewable energy is a stably priced, commercially available resource that manages fuel cost uncertainty and reduces CO₂ emissions
 - Energy efficiency programs are effective, reduce CO₂ emissions, and reduce utility and customer exposure to higher costs of electricity

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2 minute take-away for the Commission

✓ *The Commission should ask whether policies encourage innovation and its benefits or whether policies lock out new technologies or create barriers to new market entrants*

- Beneficial change is being driven by:
 - Innovation and entrepreneurship, especially from outside the electric utility industry
 - Increasing societal & market receptivity to energy efficiency and distributed renewable energy
 - Learning by consumers, entrepreneurs, utilities